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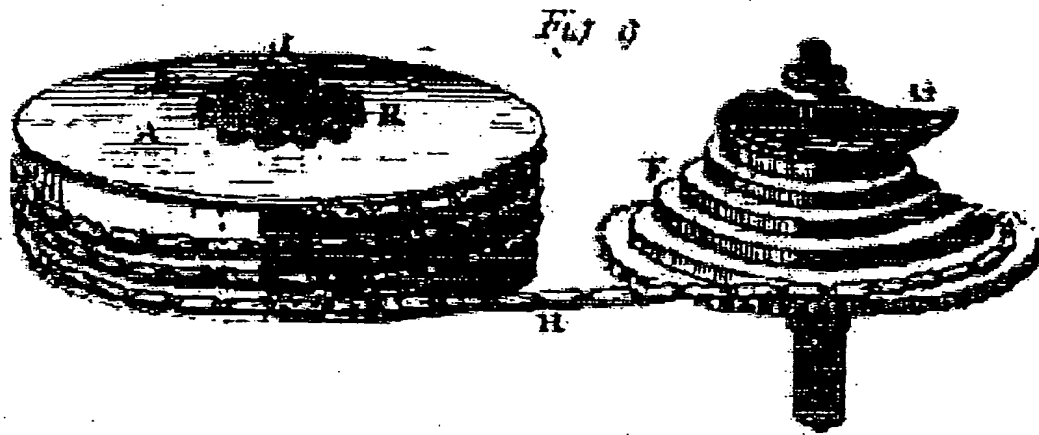
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Chain and fusee
From "Diderot et d'Alembert", 1751 -1772, Horlogerie, page CC.

Figure 1a

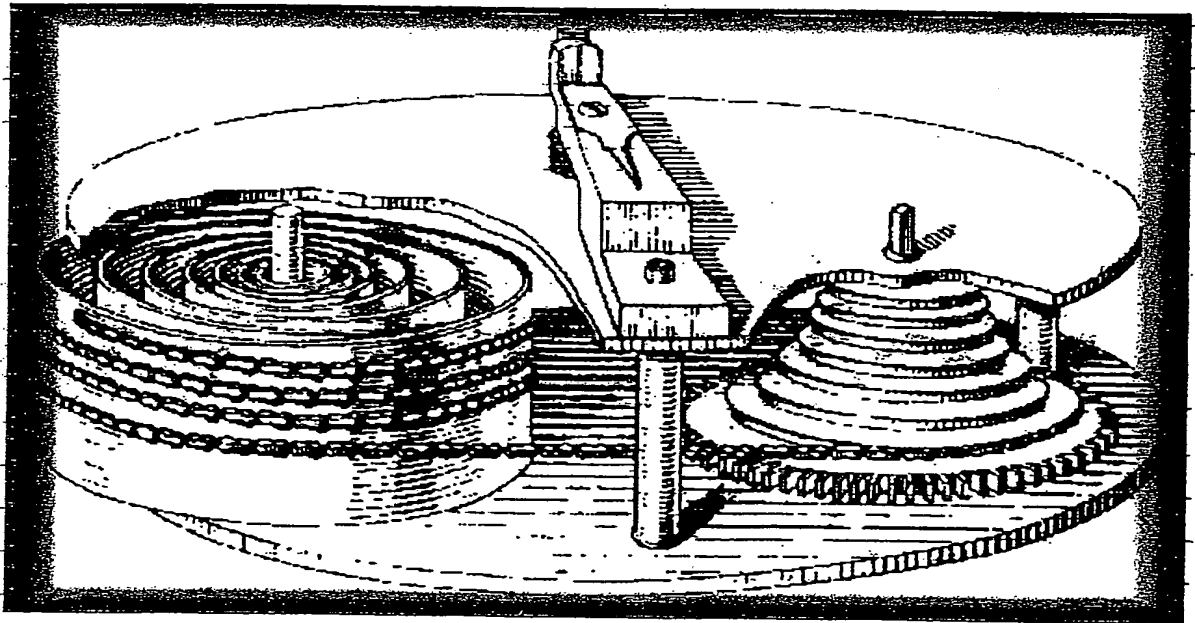


Figure 1b

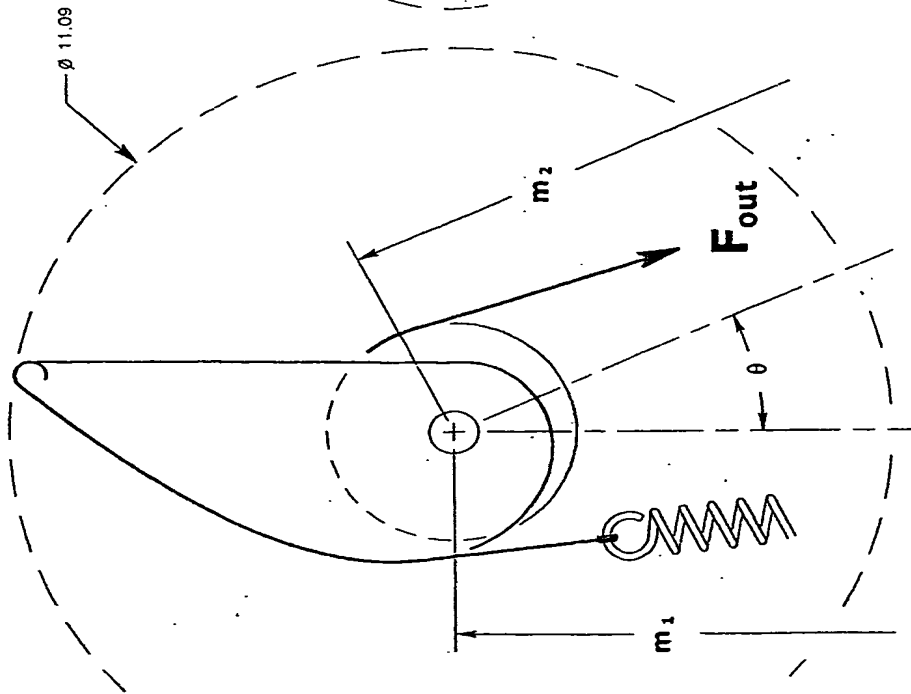


Figure 2a

Constant Force Mechanism
Constant Torque Profile

$$L_1 = L_2$$

$$\lambda_{\max} = 230 \text{ degree}$$

PRIOR ART

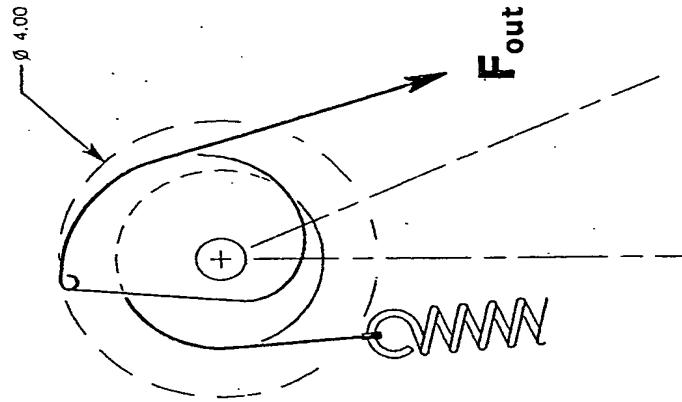


Figure 2b

Constant Force Mechanism
Linear Torque Profile

$$L_1 = L_2$$

$$\lambda_{\max} = 280 \text{ degree}$$

PRIOR ART

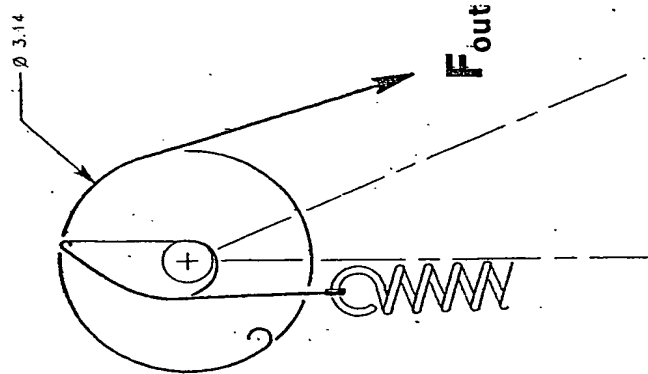


Figure 2c

Constant Force Mechanism
Constant Torque Profile

$$L_1 \ll L_2$$

$$\lambda_{\max} = 230 \text{ degree}$$

PRIOR ART

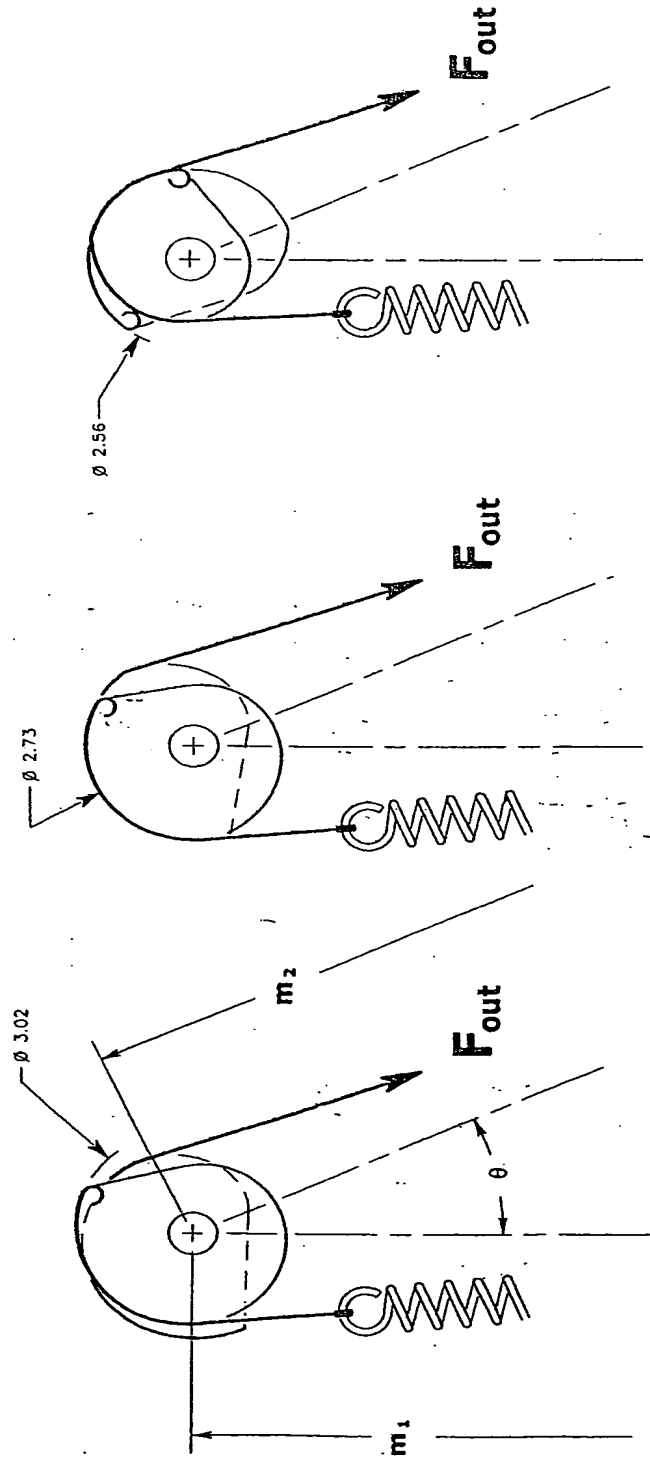


Figure 3a

Constant Force Mechanism
Parabolic Torque Profile

$$L_1 \approx L_2$$

$$\lambda_{max} = 290 \text{ degree}$$

Figure 3b

Constant Force Mechanism
Composite Torque Profile

$$L_1 \approx L_2$$

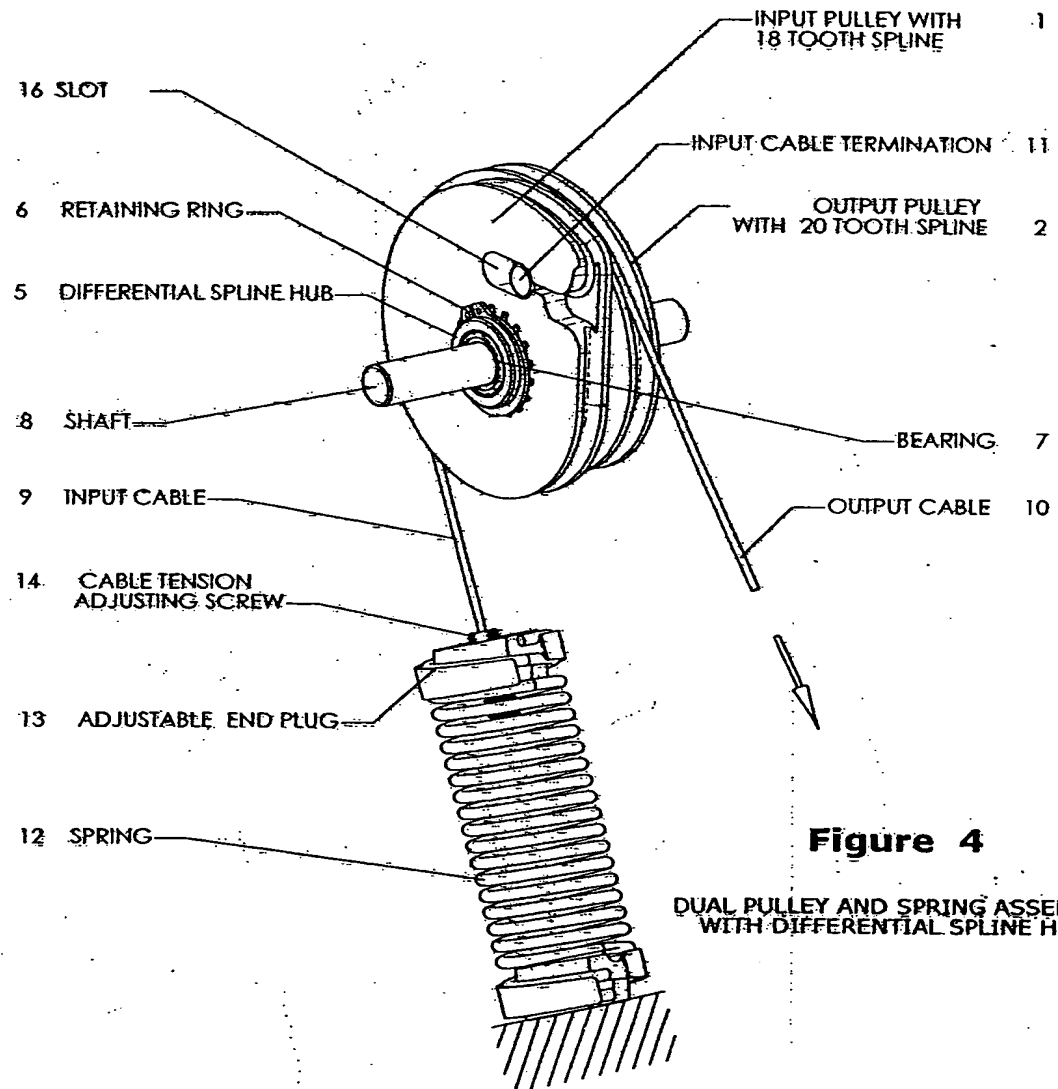
$$\lambda_{max} = 300 \text{ degree}$$

Figure 3c

Constant Force Mechanism
Composite Torque Profile

$$L_1 < L_2$$

$$\lambda_{max} = 300 \text{ degree}$$



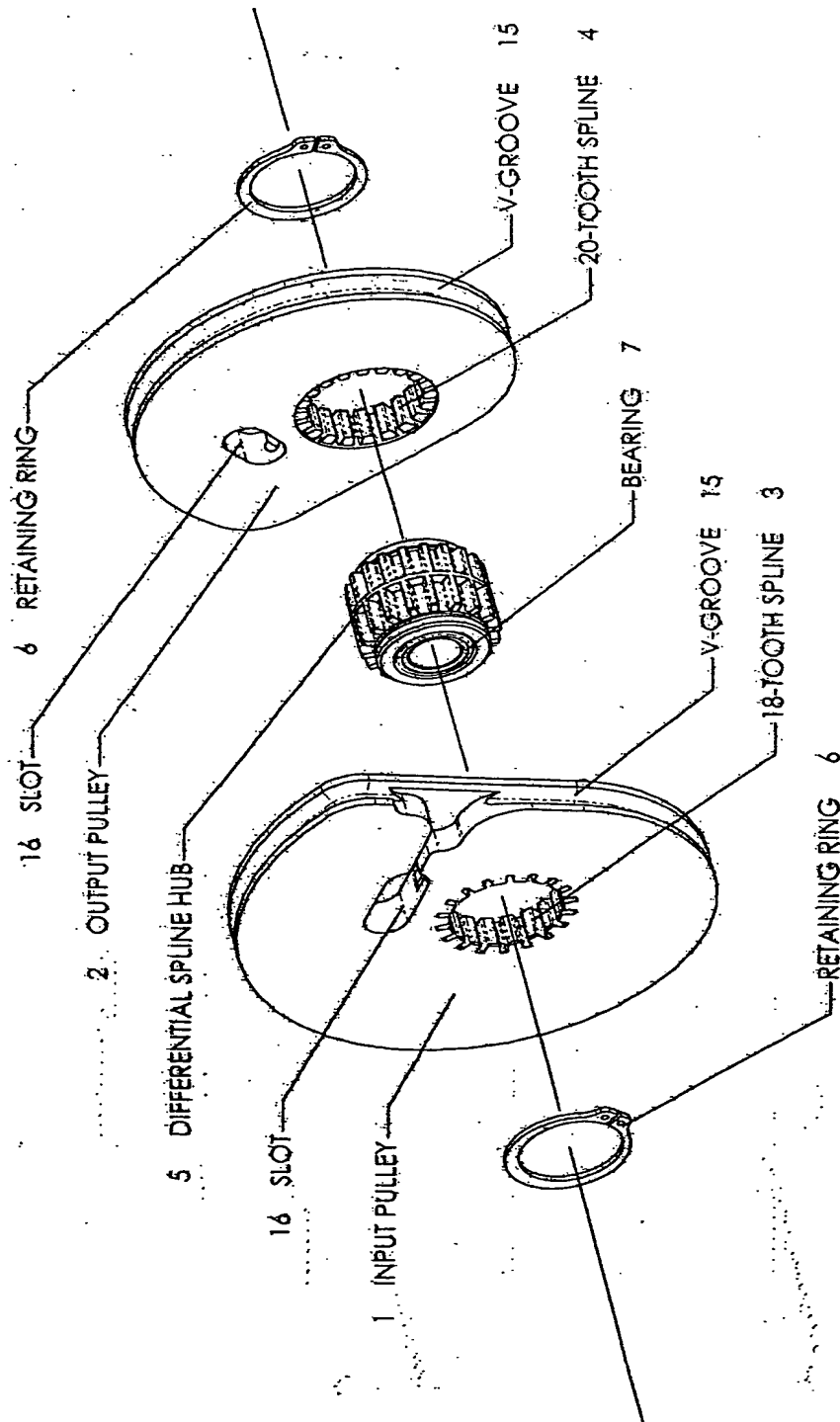
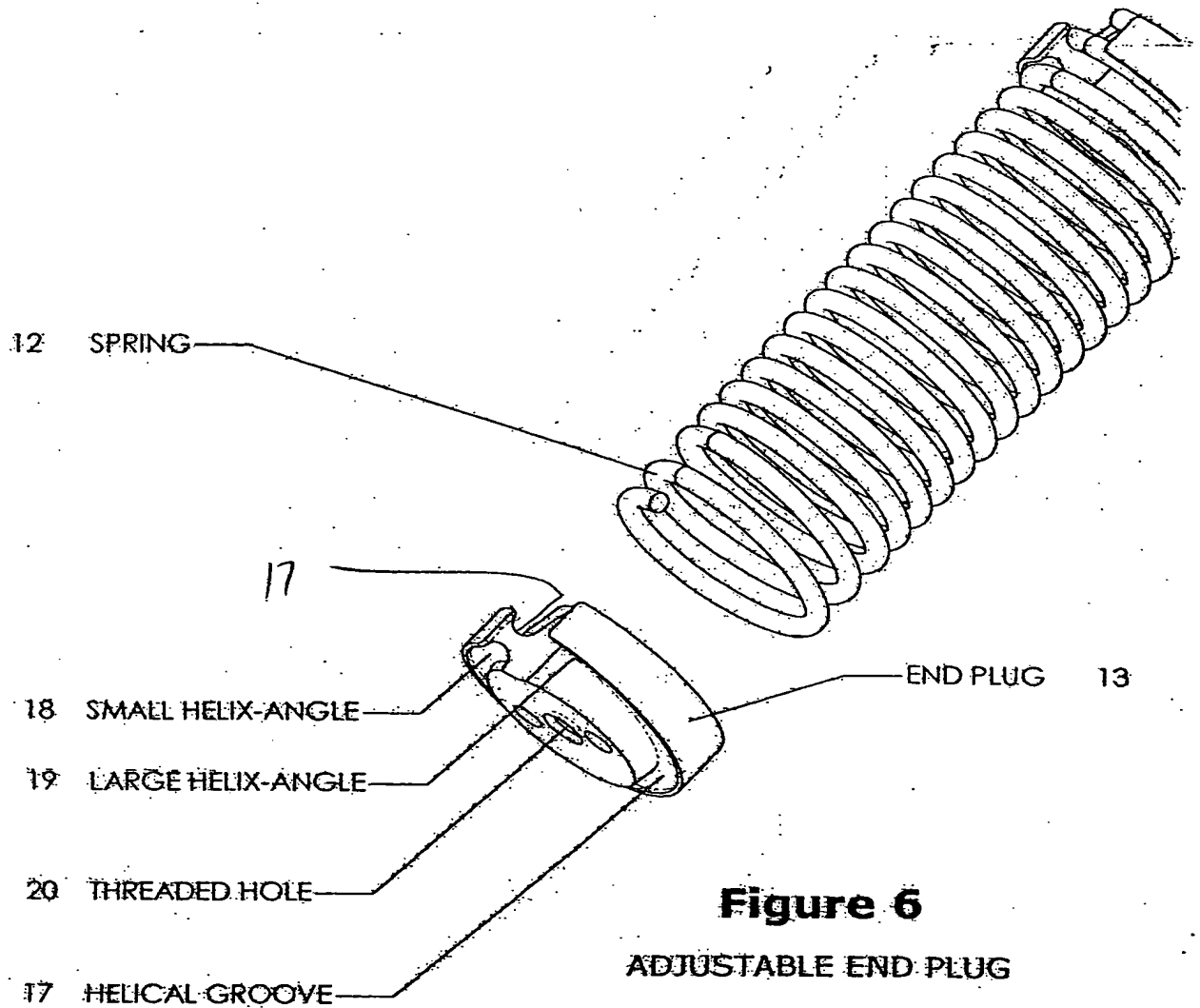


Figure 5

DUAL PULLEY ASSEMBLY
WITH DIFFERENTIAL SPLINE HUB



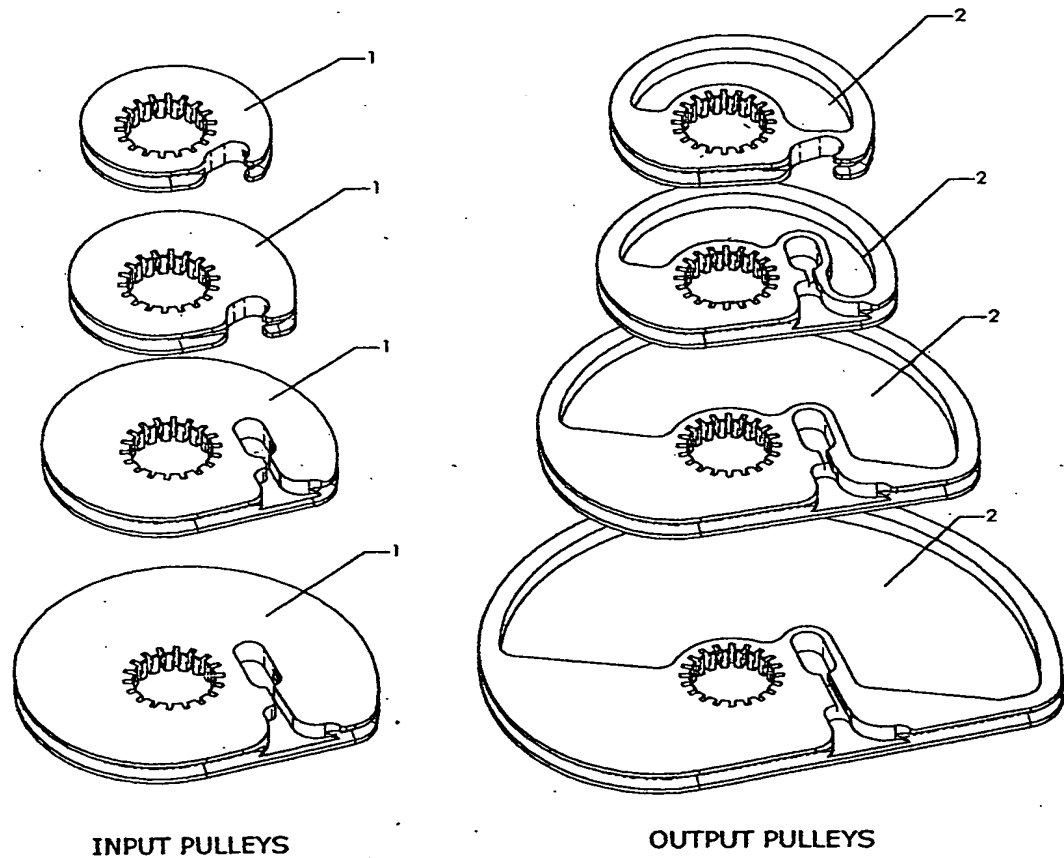


Figure 7
PULLEY ASSORTMENT

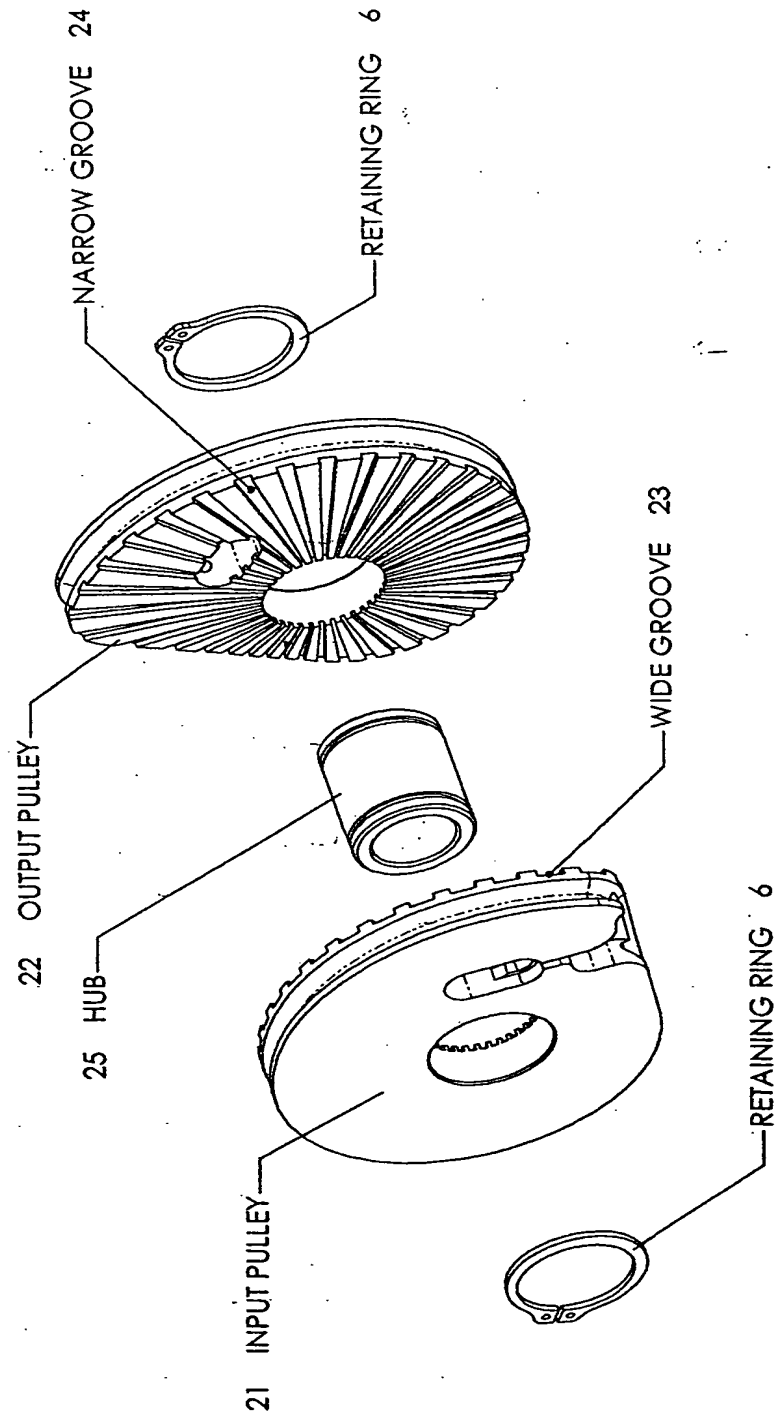


Figure 8

DUAL PULLEY ASSEMBLY
WITH RADIAL GROOVES

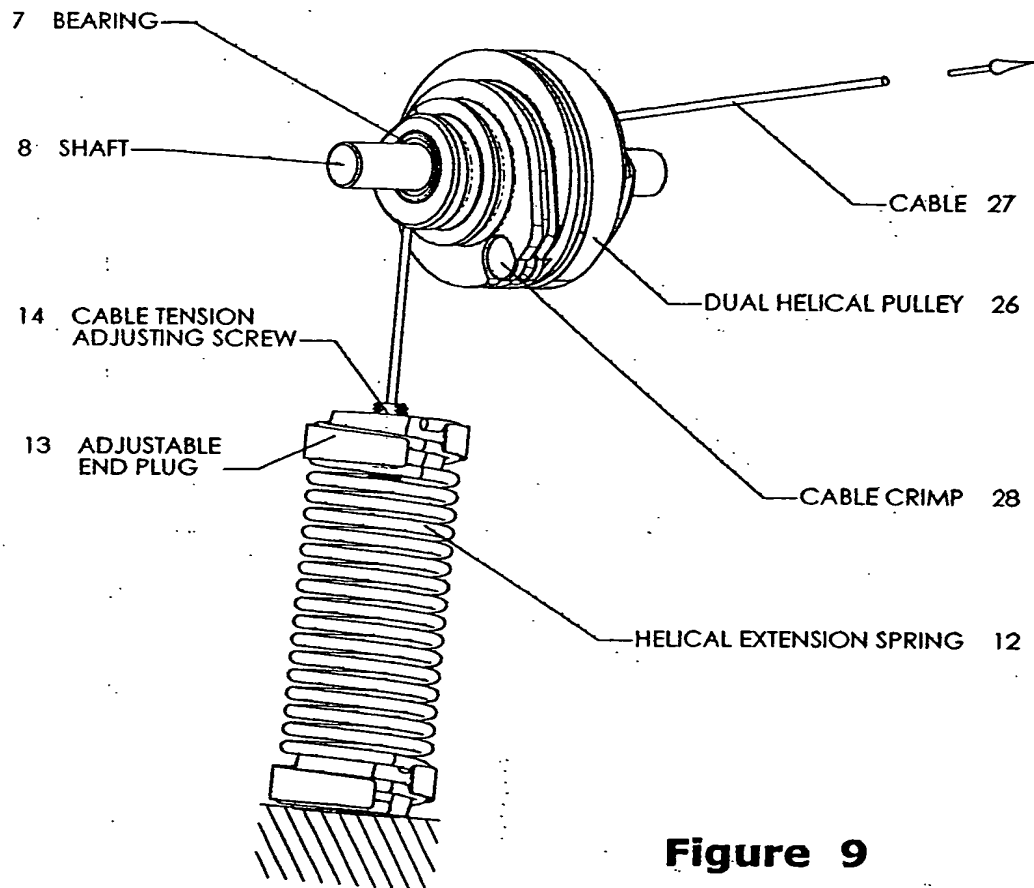


Figure 9

ADJUSTABLE SPRING
AND DUAL HELICAL PULLEY

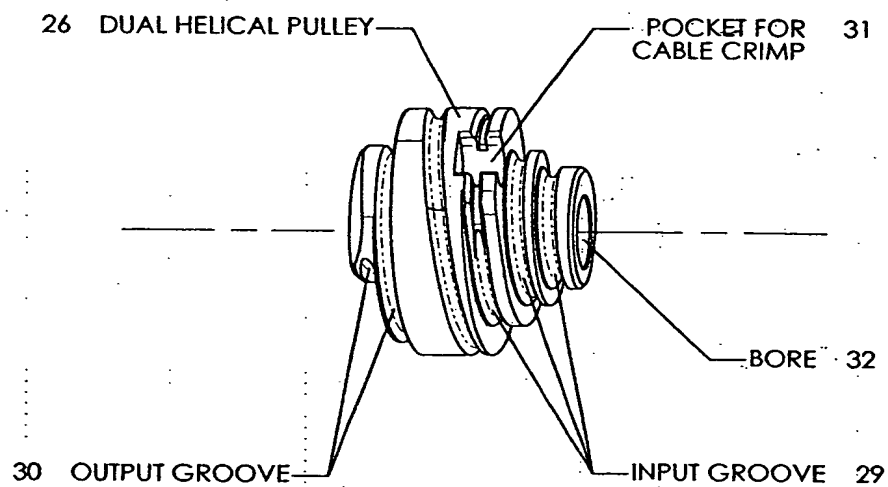


Figure 10
ONE-PIECE
DUAL HELICAL PULLEY

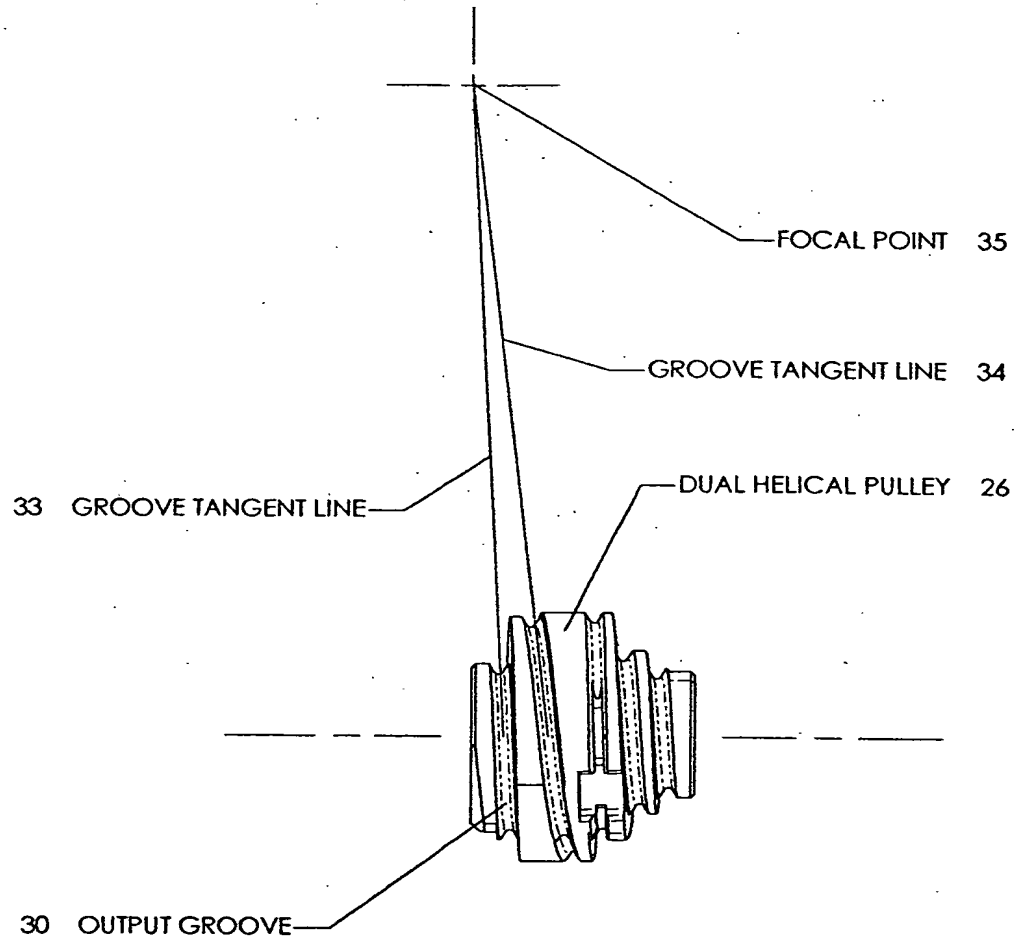


Figure 11

**FOCUSED-GROOVE
DUAL HELICAL PULLEY**

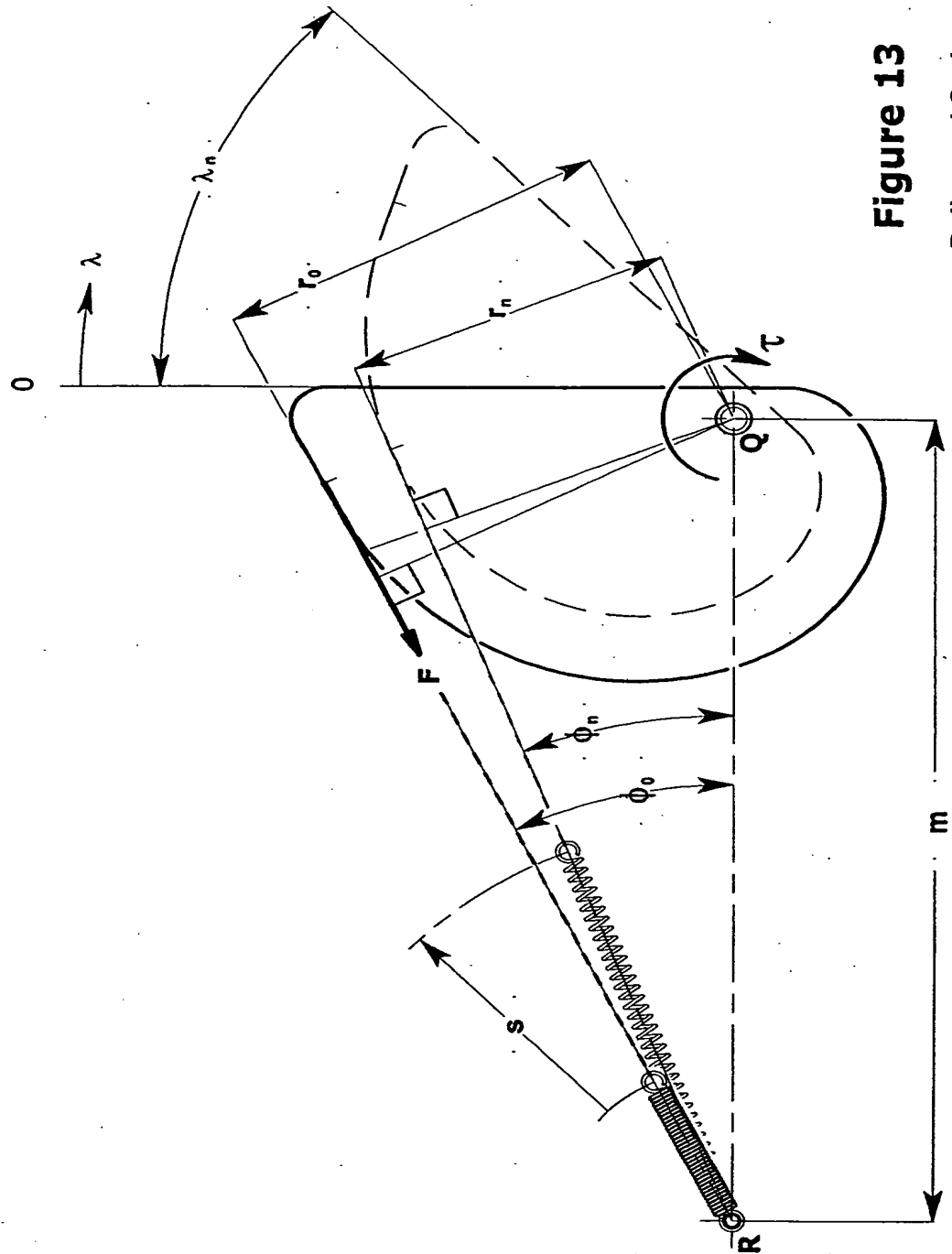


Figure 13
 Pulley and Spring
 Free Body Diagram

Figure 14a
Single Stage Input Pulley
with a Constant Torque Profile
Radius vs. Pulley Angle

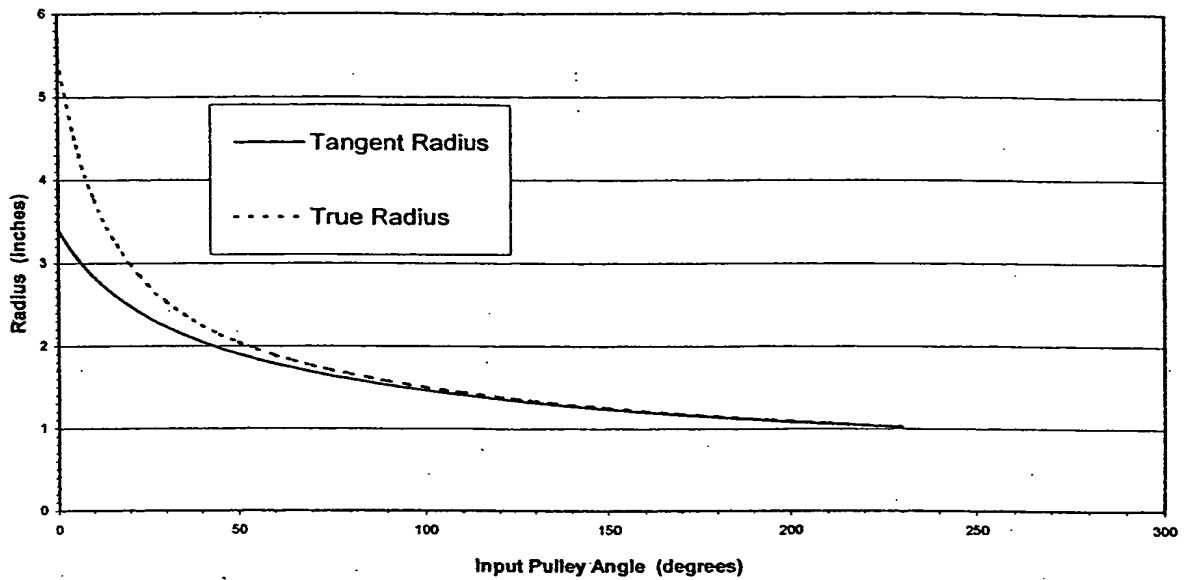


Figure 14b
Single Stage Output Pulley
with a Linear Torque Profile
Radius vs. Pulley Angle

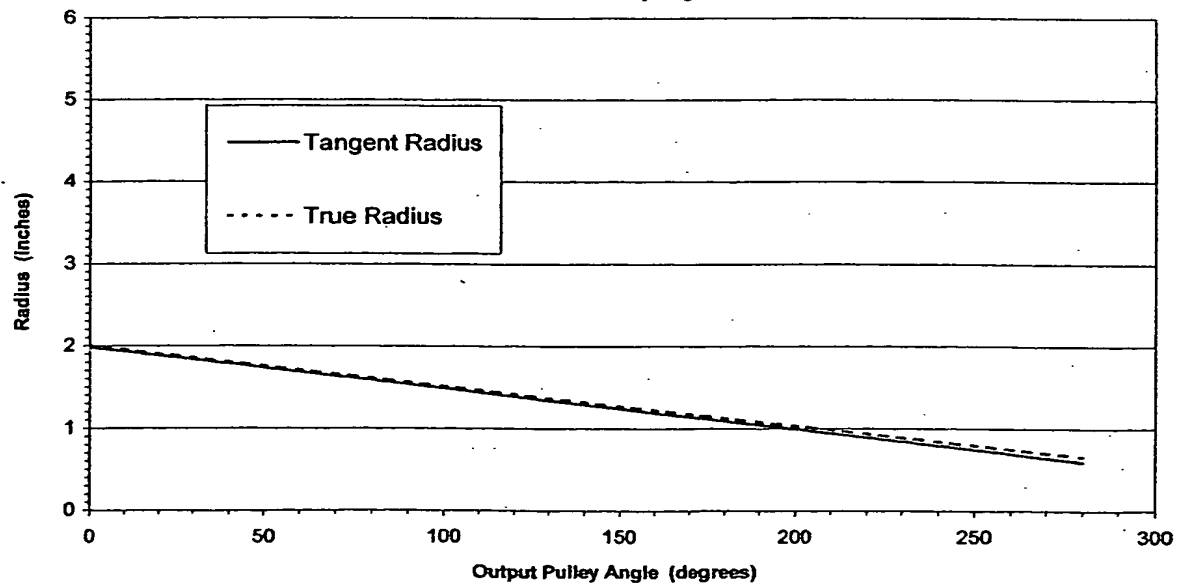


Figure 15a
Input Pulley
With a Composite Torque Profile
Radius vs. Pulley Angle

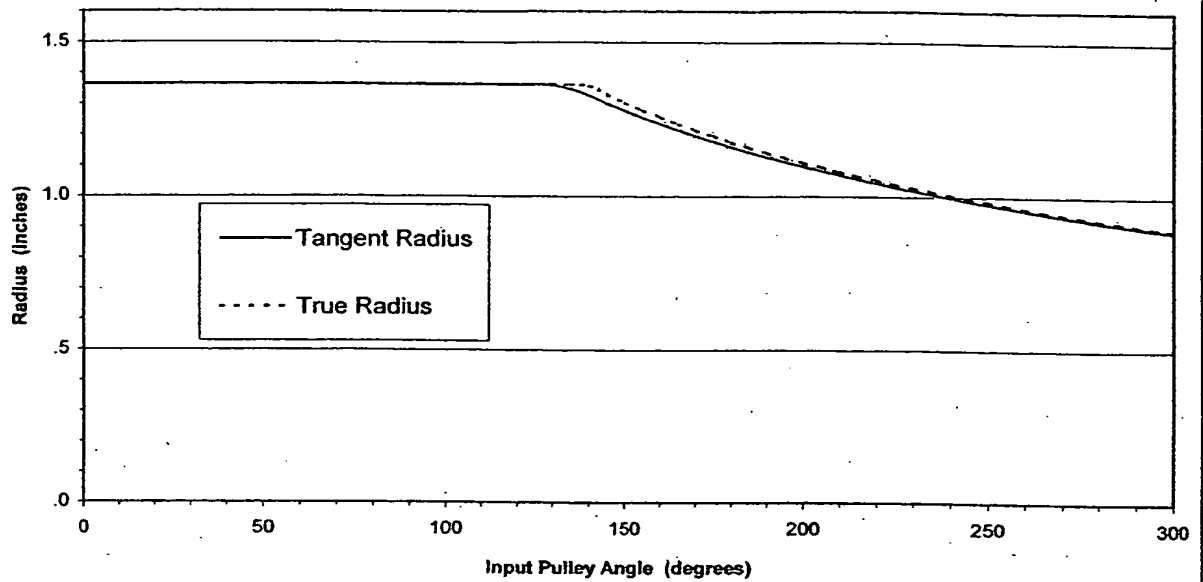


Figure 15b
Output Pulley
With a Composite Torque Profile
Radius vs. Pulley Angle

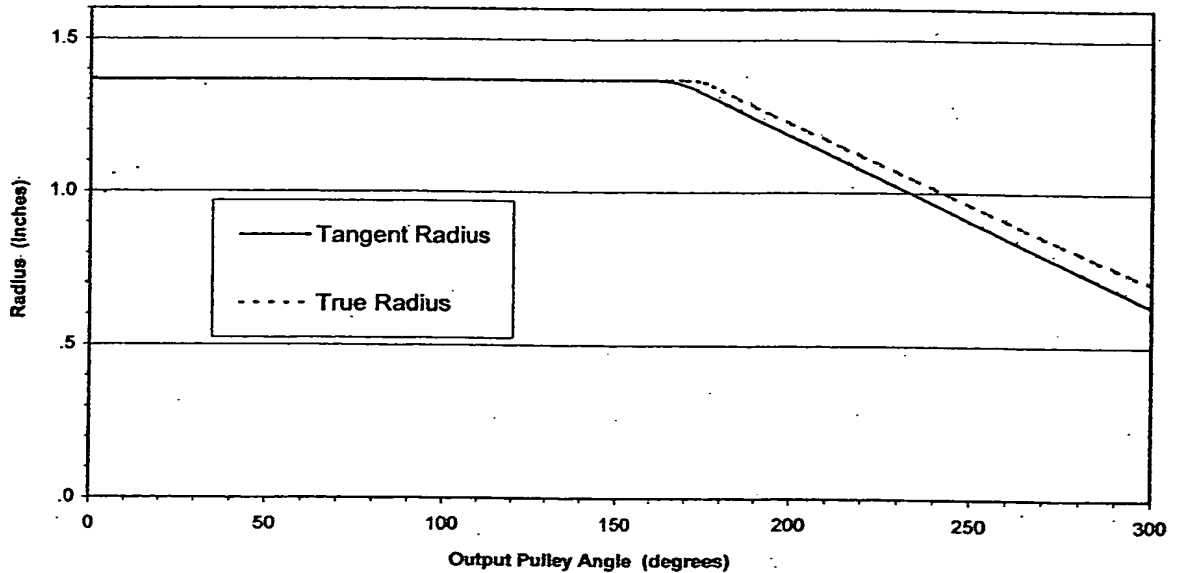


Figure 16a
Input Pulley
With a Parabolic Torque Profile
Radius vs. Pulley Angle

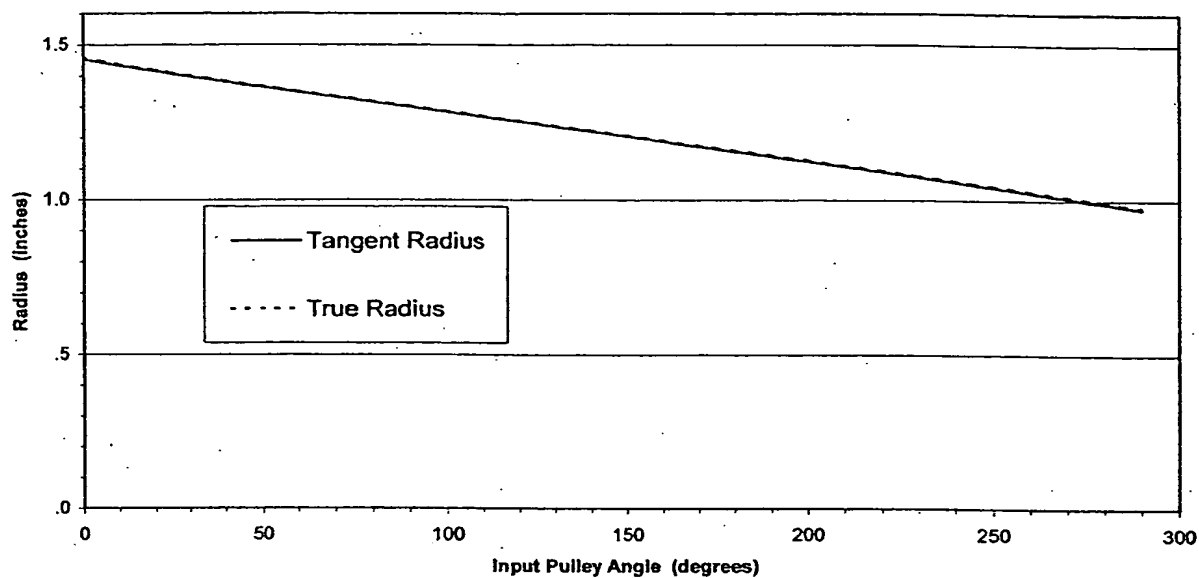


Figure 16b
Output Pulley
With a Parabolic Torque Profile
Radius vs. Pulley Angle

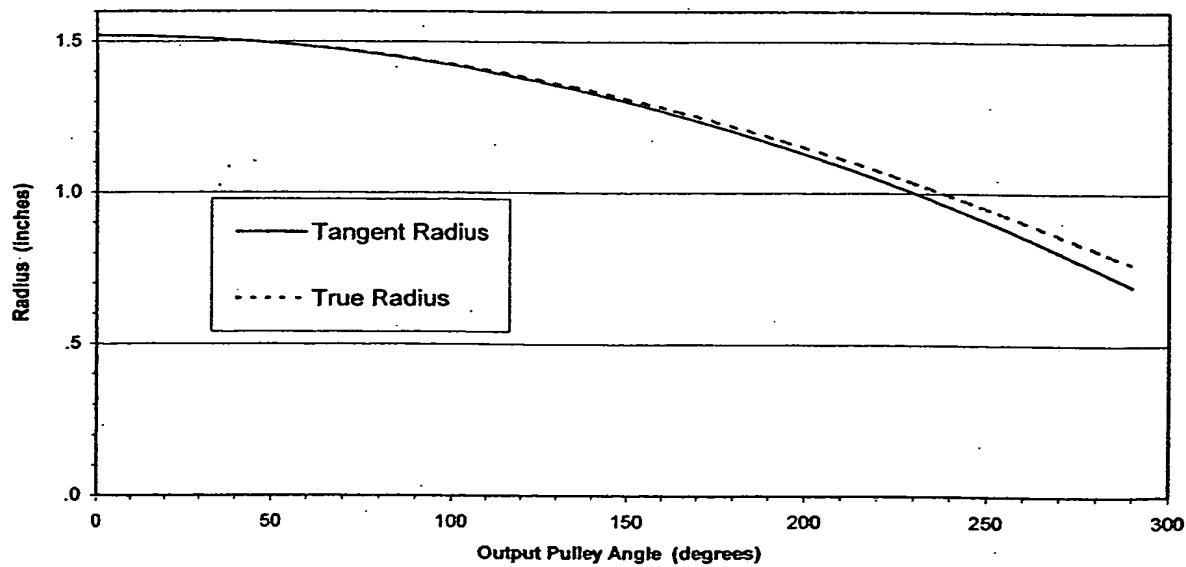
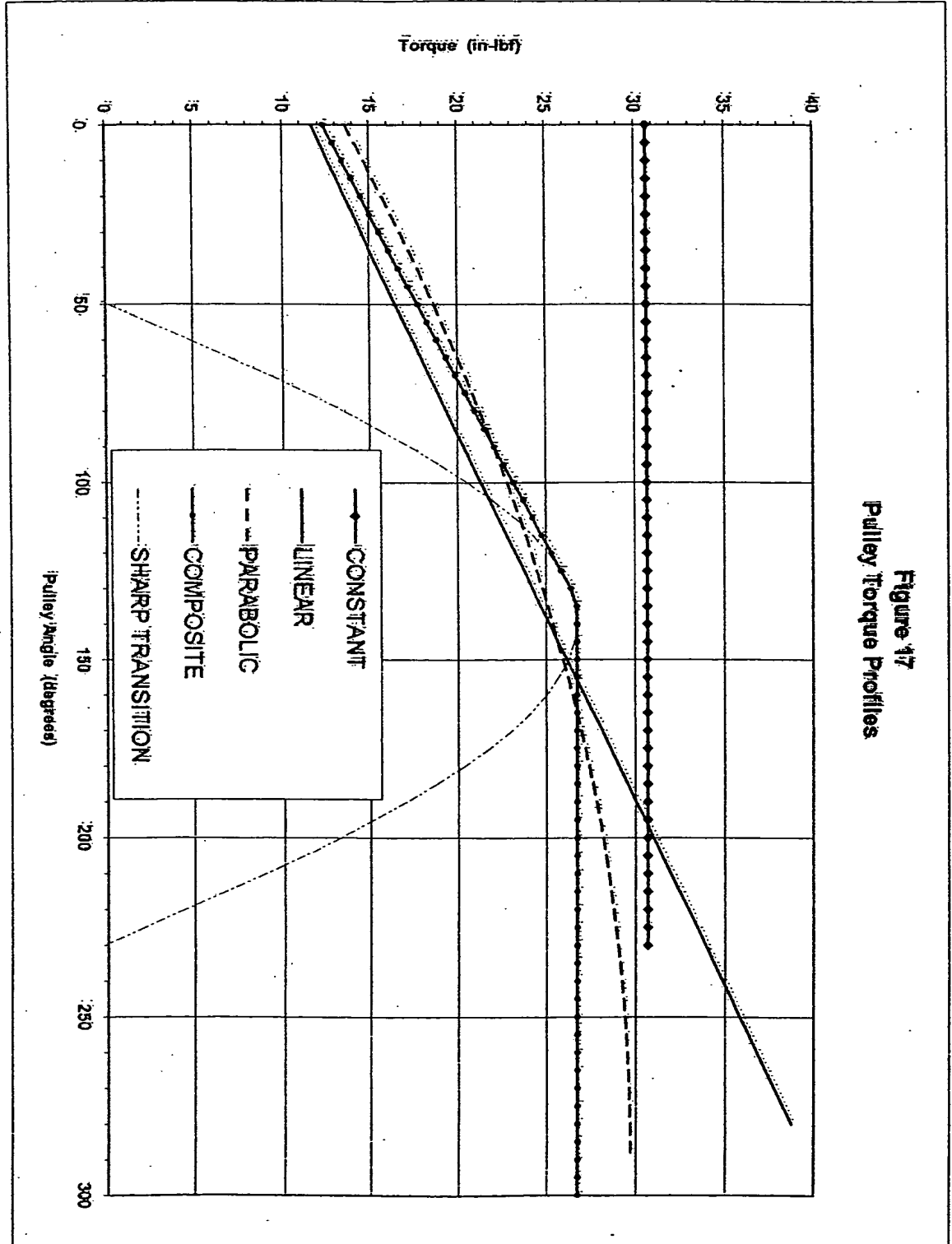


Figure 17
Pulley Torque Profiles



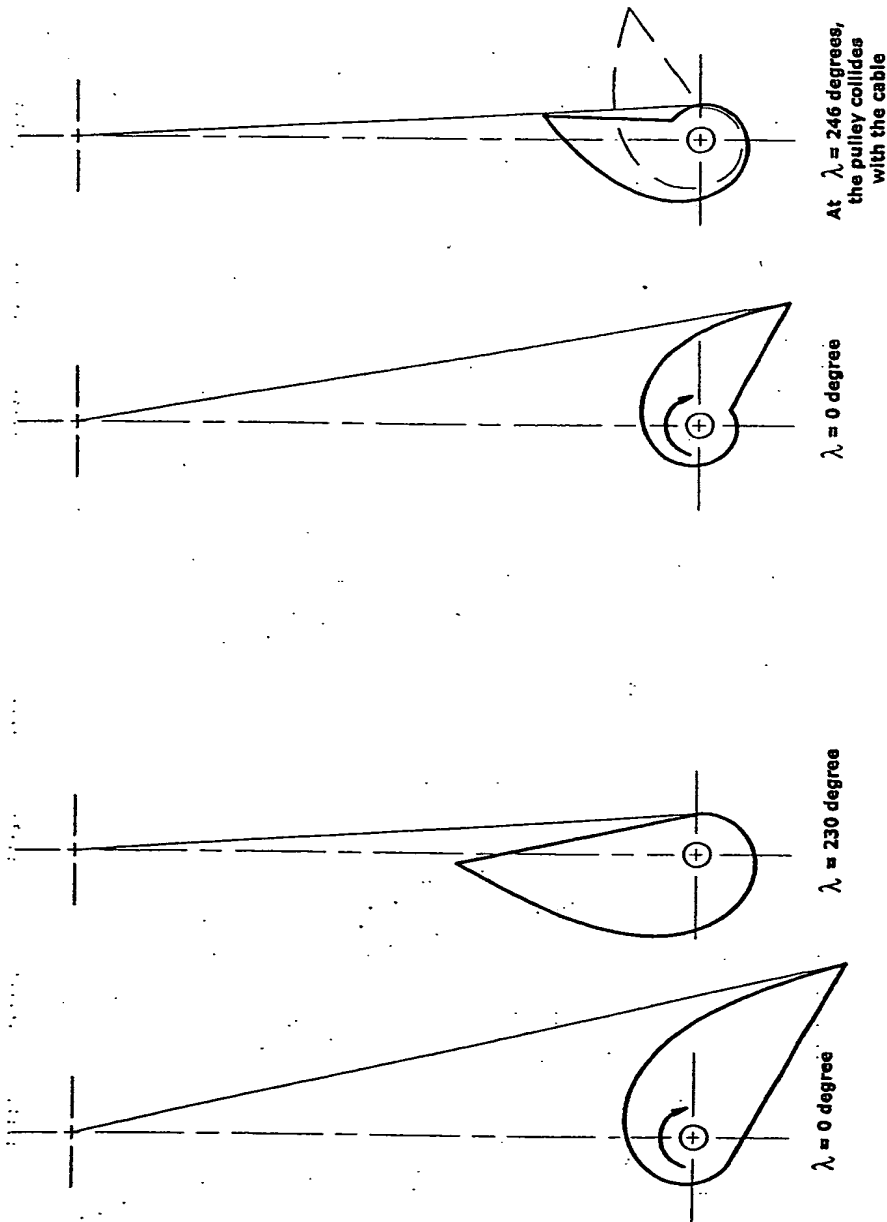


Figure 18a
 Maximum Angle of Rotation
 $\lambda_{\max} = 230$ degree

Figure 18b
 Maximum Angle of Rotation
 $\lambda_{\max} = 300$ degree

Figure 19a
Input Pulley
Tangent Radius vs. Angle

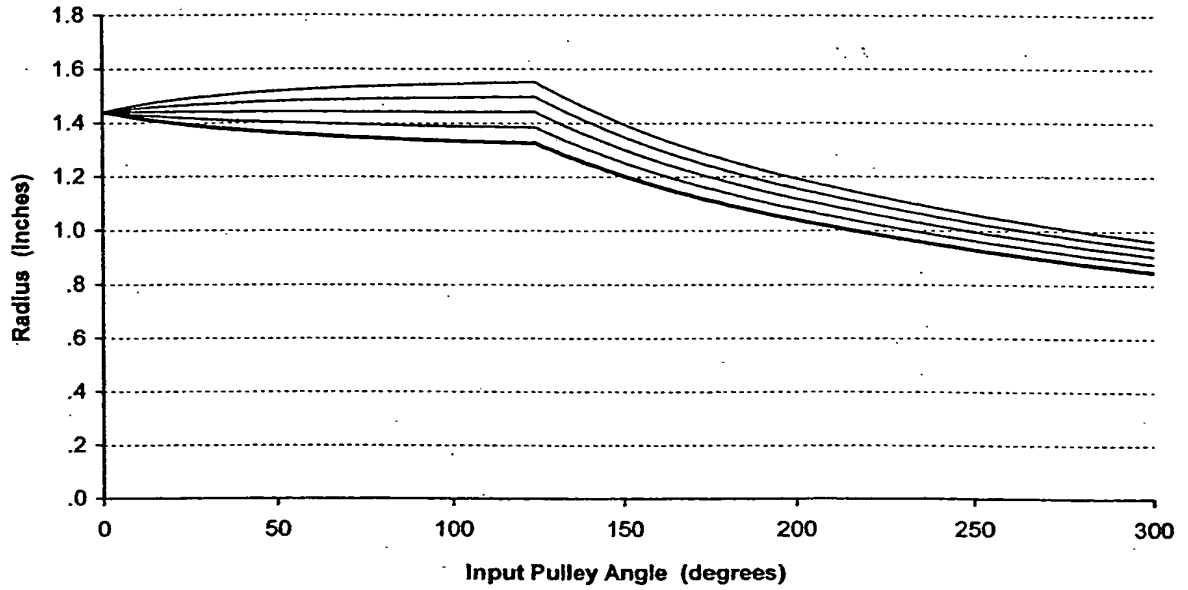


Figure 19b
Pulley Torque vs. Angle

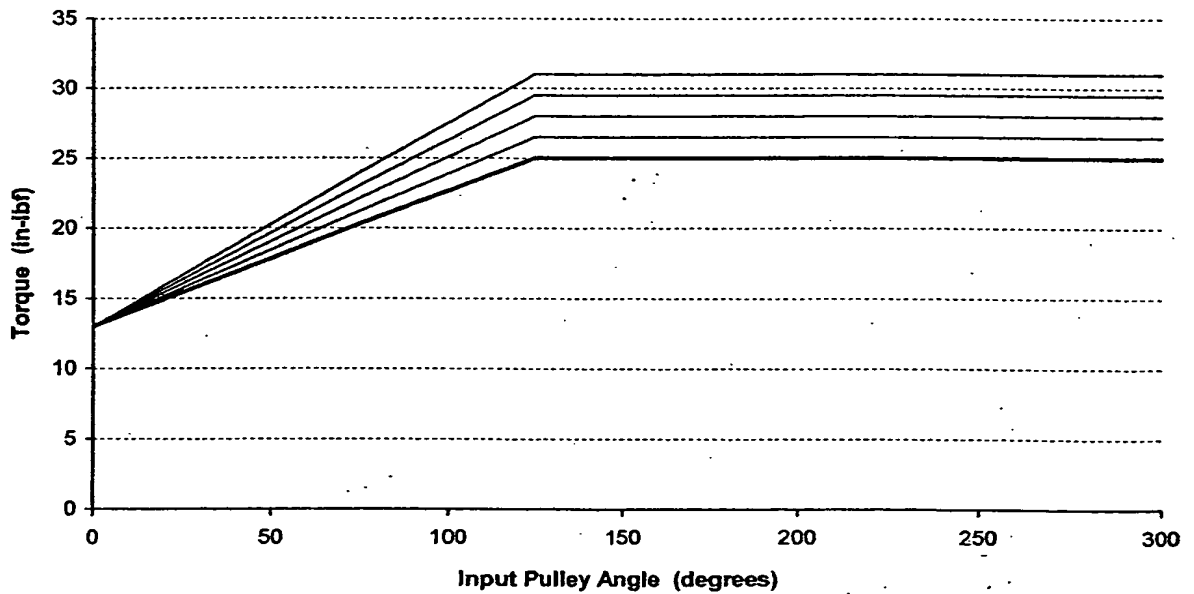


Figure 20a
Input Pulley
Tangent Radius vs. Angle

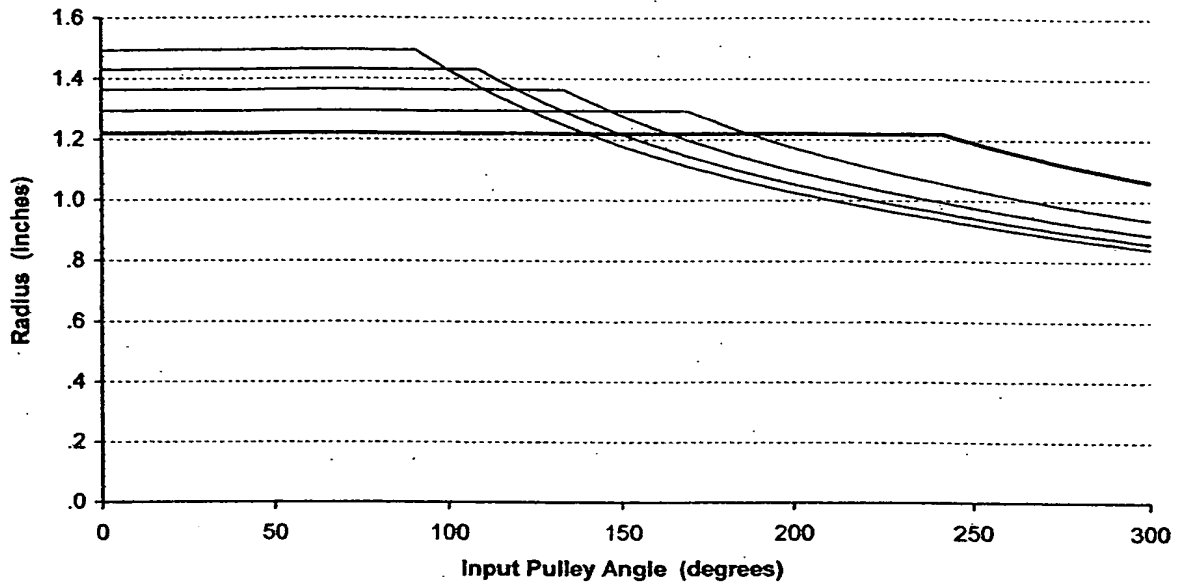


Figure 20b
Pulley Torque vs. Angle

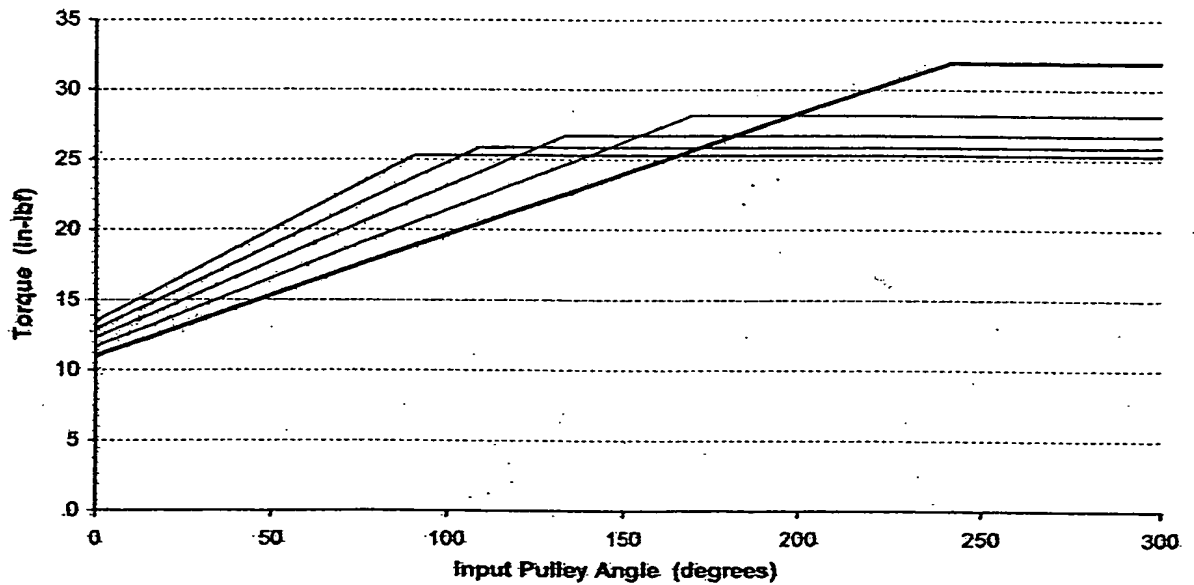


Figure 21a
Output Pulley
Tangent Radius vs. Angle

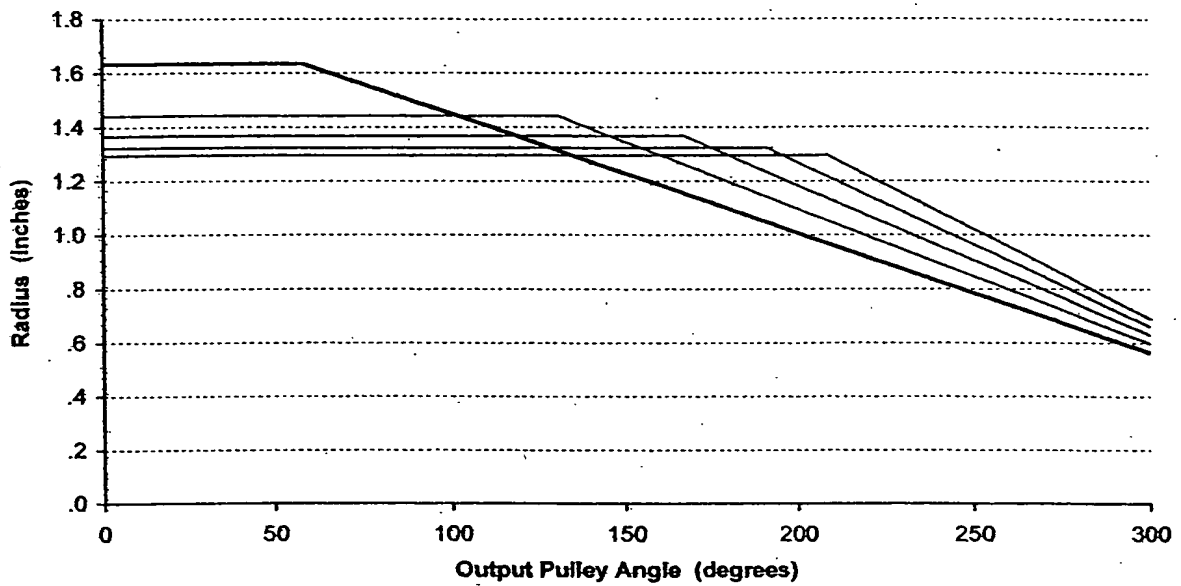
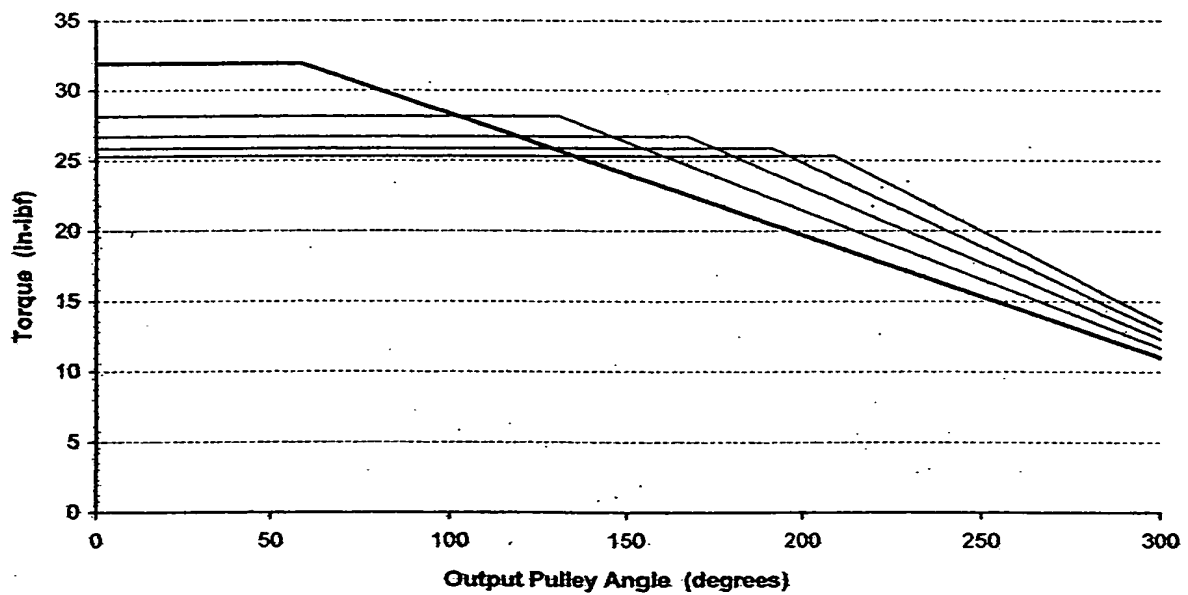
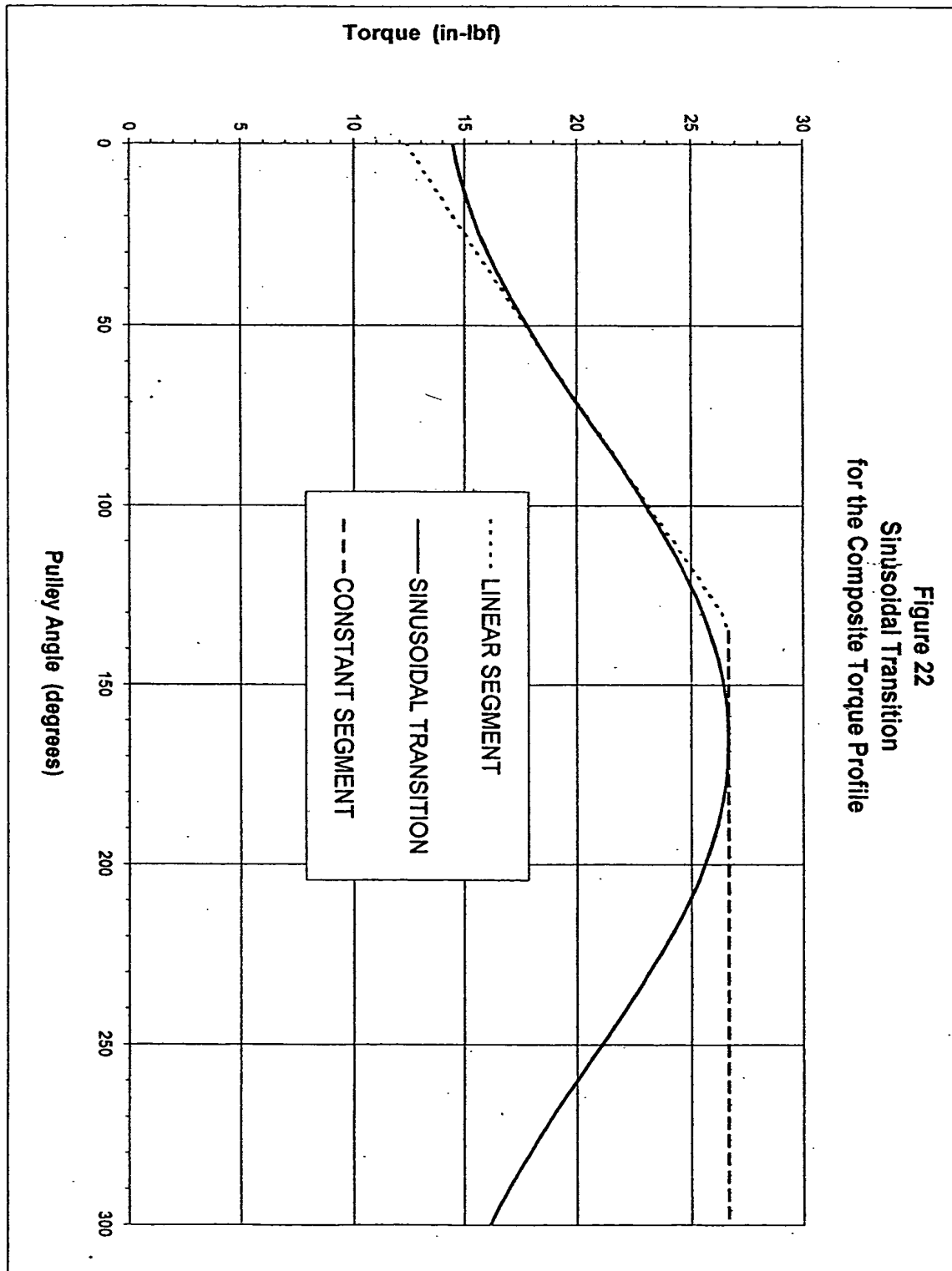
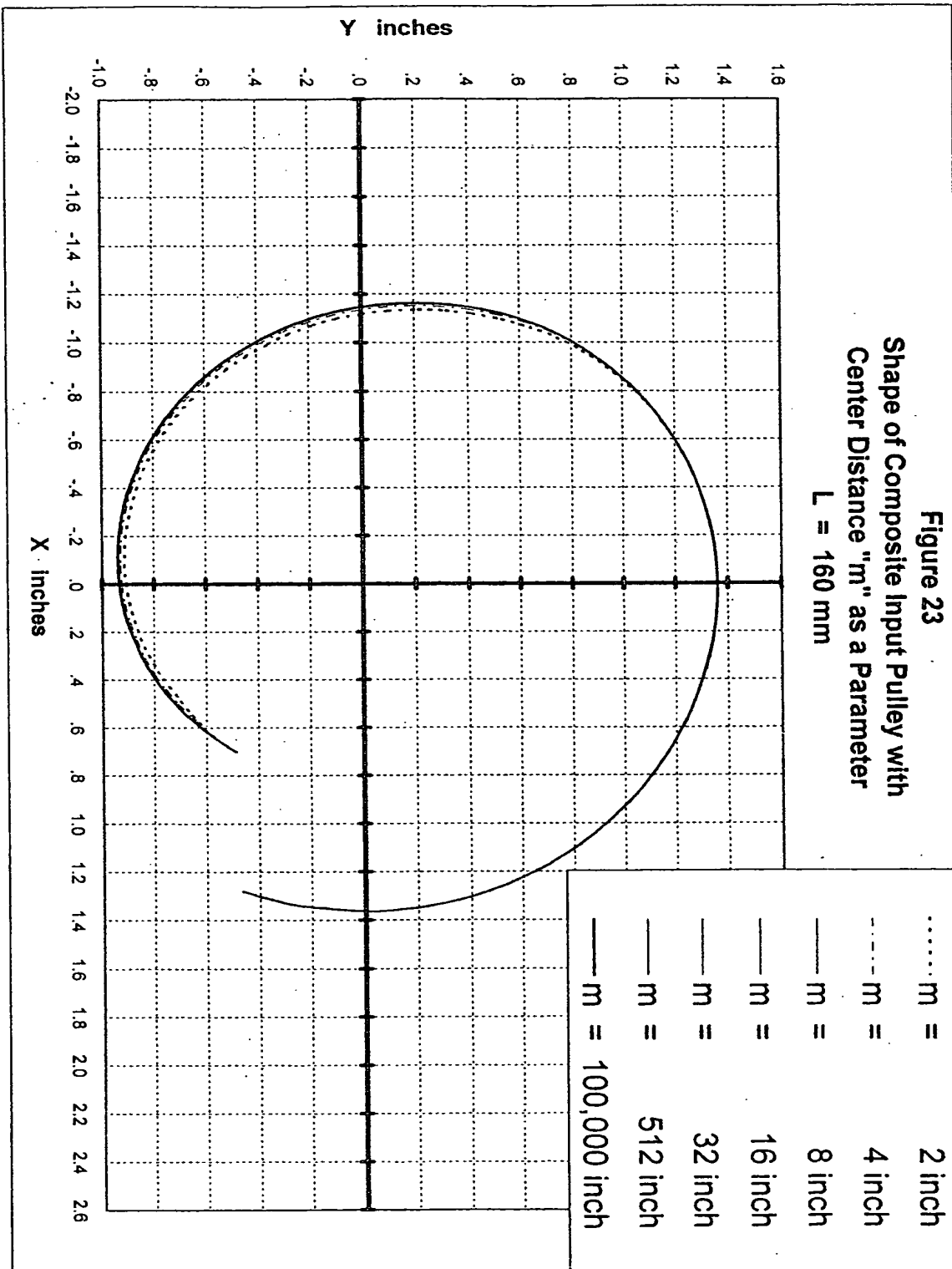


Figure 21b
Pulley Torque vs. Angle







Y inches

